

NOTES ON THE IDENTIFICATION AND DISTRIBUTION OF THE SPECIES OF THE GENUS GALIUM (RUBIACEAE) IN LOUISIANA

Charles M. Allen

Colorado State University, Fort Polk Station 1697 23rd St.
Fort Polk, Louisiana 71459, U.S.A
Charles.M.Allen1.ctr@mail.mil

ABSTRACT

A key to and distribution of the species of the genus *Galium* in Louisiana are presented. Three species are reported new to the Louisiana flora: *Galium anglicum* Huds., *G. asprellum* Michx., and *G. divaricatum* Pourr. ex Lam while three other species (*G. obtusum* Bigelow, *G. trifidum* L., and *G. orizabense* Hemsl.) are excluded. The current number of species includes three introduced annuals, two native annuals, and seven native perennials.

RESUMEN

Se presenta una clave de las especies del género *Galium* y su distribución en Luisiana. Se citan tres especies nuevas para la flora de Luisiana: *Galium anglicum* Huds., *G. asprellum* Michx., y *G. divaricatum* Pourr. ex Lam mientras que se excluyen otras tres especies (*G. obtusum* Bigelow, *G. trifidum* L., y *G. orizabense* Hemsl.). El número actual de especies incluye tres anuales introducidas, dos anuales nativas, y siete perennes nativas.

Twelve species of the genus *Galium* (Rubiaceae) are listed for Louisiana in the Plants Database (USDA, NRCS 2012) and by MacRoberts (1984) while 11 species are listed by Thomas and Allen (1998). Specimens of *Galium* collected in Louisiana were examined and annotated from the following herbaria: Louisiana State University, Baton Rouge (LSU); Louisiana State University in Shreveport (LSUS); Louisiana Tech University, Ruston (LTU); University of Louisiana at Lafayette (LAF); and University of Louisiana at Monroe (NLU). The in-state distribution is based on these data as well as the work of Thomas and Allen (1998). The keys to species, descriptions, and habitat information are based on field observations, herbarium specimens, and published works including Correll and Johnston (1970), Diggs et al (1999) Lipscomb and Nesom (2007), Radford et al (1968), and Wunderlin (1998). The current list of *Galium* species in Louisiana numbers 12 and includes three introduced annuals, two native annuals, and seven native perennials.

The following *Galium* taxa are new to the Louisiana flora: *Galium anglicum* Huds., *G. asprellum* Michx., and *G. divaricatum* Pourr. ex Lam. The following *Galium* taxa are excluded from the Louisiana Flora: *G. obtusum* Bigelow, *G. trifidum* L., and *G. orizabense* Hemsl. *Galium obtusum* Bigelow was reported from a number of parishes by Thomas and Allen (1998) but all herbarium specimens examined were *G. tinctorium* with three petals only. No specimens with four petals were seen as reported for *G. obtusum* by Puff (1977). Thomas and Allen (1998) reported *Galium trifidum* L. from Orleans and West Feliciana parishes but these were miss-identified *G. triflorum* Michx. *Galium orizabense* Hemsl. is reported for Louisiana by USDA NRCS (2012) based on Thomas and Allen (1984), but this publication does not include the genus *Galium*. No herbarium specimens of *G. orizabense* from Louisiana were found.

KEY TO THE SPECIES OF GALIUM IN LOUISIANA

1. Fruit fleshy.
 2. Leaves elliptic, less than four times as long as wide _____ **6. *G. hispidulum***
 2. Leaves linear, more than four times as long as wide _____ **11. *G. uniflorum***
1. Fruit dry, not fleshy.
 3. Fruit distinctly bristly.
 4. Flowers and fruits short pedicelled.
 5. Plant perennial; blades ovate, three veined, longer than 10 mm _____ **4. *G. circaeans***
 5. Plant annual; blades oblong, one veined, shorter than 10 mm _____ **12. *G. virgatum***
 4. Flowers and fruits long pedicelled.

6. Stems and leaves distinctly scabrous.		
7. Leaves in whorls of six; blades 1 cm or shorter, 1 mm or narrower	_____	7. <i>G. parisiense</i>
7. Leaves in whorls of eight or seven; blades longer than 1 cm, wider than 1 mm	_____	2. <i>G. aparine</i>
6. Stems and leaves glabrous to pubescent but not distinctly scabrous.		
8. Leaves in whorls of six; blades glabrous or with scabrous margins, apex mucronate	_____	10. <i>G. triflorum</i>
8. Leaves in whorls of four; blades pubescent, apex not mucronate	_____	8. <i>G. pilosum</i>
3. Fruit smooth.		
9. Plant perennial.		
10. Stems and leaves distinctly scabrous	_____	3. <i>G. asprellum</i>
10. Stems and leaves glabrous	_____	9. <i>G. tinctorium</i>
9. Plant annual.		
11. Inflorescence relatively diffuse, branches divaricate; ultimate fruits (2-)3-6(-7) nodes beyond primary stem axis (with largest leaves); first inflorescence internode (beyond primary stem axis) 15-50 mm long;	_____	5. <i>G. divaricatum</i>
11. Inflorescence relatively strict, branches ascending; ultimate fruits 2-3(-4) nodes beyond primary stem axis (with largest leaves); first inflorescence internode (beyond primary stem axis) 3-12(-20) mm long	_____	1. <i>G. anglicum</i>

1. *Galium anglicum* Huds. (*G. parisiense* L. var. *trichocarpum* Tausch) is an introduced annual. It is known from only one location in Louisiana. Bossier Parish: Median and roadbank of I-20 at U.80 over-pass just W of Rest Area, E of Filmore-Haughton Exit Sec. 10, T18N R11W, Thomas 156334, 11 May 1998 (NLU). This collection is the first for Louisiana. Lipscomb and Nesom (2007) report this species from AL, AR, GA, MO, NC, OK, SC, TN, TX, VA, and WV.

2. *Galium aparine* L. is a native annual that is common and widespread in the state in roadside ditches, lawns, vacant lots and other disturbed areas and is reported from all 64 parishes (Fig. 1). It is reported from all 48 conterminous states and AK in the US and most of Canada (USDA NRCS 2012).

3. *Galium asprellum* Michx. is a native (but perhaps introduced in Louisiana) perennial. The collection data for this species in Louisiana are: Caddo Parish: along railroad tracks near center of Kansas City Southern Railroad Yard W of La 173, E of Blanchard, sec 19 T18N R14W, Thomas 65094, 29 May 1979 (NLU). This is the first collection for Louisiana and possibly represents a one-time introduction that did not persist. This species is a northern species and is reported from MO, TN, NC, and all states to the north of these except for KY (USDA, NRCS 2012). It is also reported from New Brunswick, Newfoundland, Ontario, and Quebec in Canada.

4. *Galium circaezens* Michx. is a native perennial of well-drained forests mostly along streams in the pine regions of the state (Fig. 2). It is reported from all the eastern states in the US west to TX, OK, KS, and NE (absent from ND and SD). It is also reported from Ontario and Quebec in Canada (USDA, NRCS 2012).

5. *Galium divaricatum* Pourr. ex Lam. is an introduced annual. The collection data are Caddo Parish: along railroad tracks near North Lakeshore Drive west of La 173 SWE of Blanchard Sec. 19, T18N R14W, Thomas 83085, 17 Apr 1983 (NLU); and at the same location; Thomas 99537, 26 Apr 1987 (NLU) and Thomas 88323, 28 Apr 1984 (NLU). Along railroad tracks in Kansas City Southern Yard west of La 169, south of Blanchard at North Lakeshore Drive Sec. 19, T19N R14W, Thomas 76697, 21 May 1981 (NLU). These collections are the first for Louisiana. Lipscomb and Nesom (2007) report this species from AL, IN, KY, and TX. It is reported from AL, AR, CA, GA, IN, KY, LA, MO, MS, NC, OR, TN, VA, VT, and WV by USDA NRCS (2012).

6. *Galium hispidulum* Michx. is a native perennial of sandy, well-drained soils. It is reported from three parishes in SE and NW Louisiana (Fig. 3). It is an Atlantic and Gulf coastal plain species with reports also from AL, FL, GA, MD, MS, NC, NJ, SC, TX, and VA.

7. *Galium parisiense* L. is an introduced annual. It is recorded from roadsides and other disturbed areas mostly in western Louisiana (Fig. 4). Lipscomb and Nesom (2007) report this species from AL, IN, KY, MO, and TN. USDA NRCS (2012) reports it from CA, OR, and WA in the US and BC in Canada.

8. *Galium pilosum* Ait. is a native perennial that is widespread in Louisiana. Its habitats include pine forests, hardwood forests, prairies, and the northern portion of the coastal marsh but is absent from the large floodplain areas along the southern Mississippi River and lower coastal marsh (Fig. 5). It is also reported from AL,

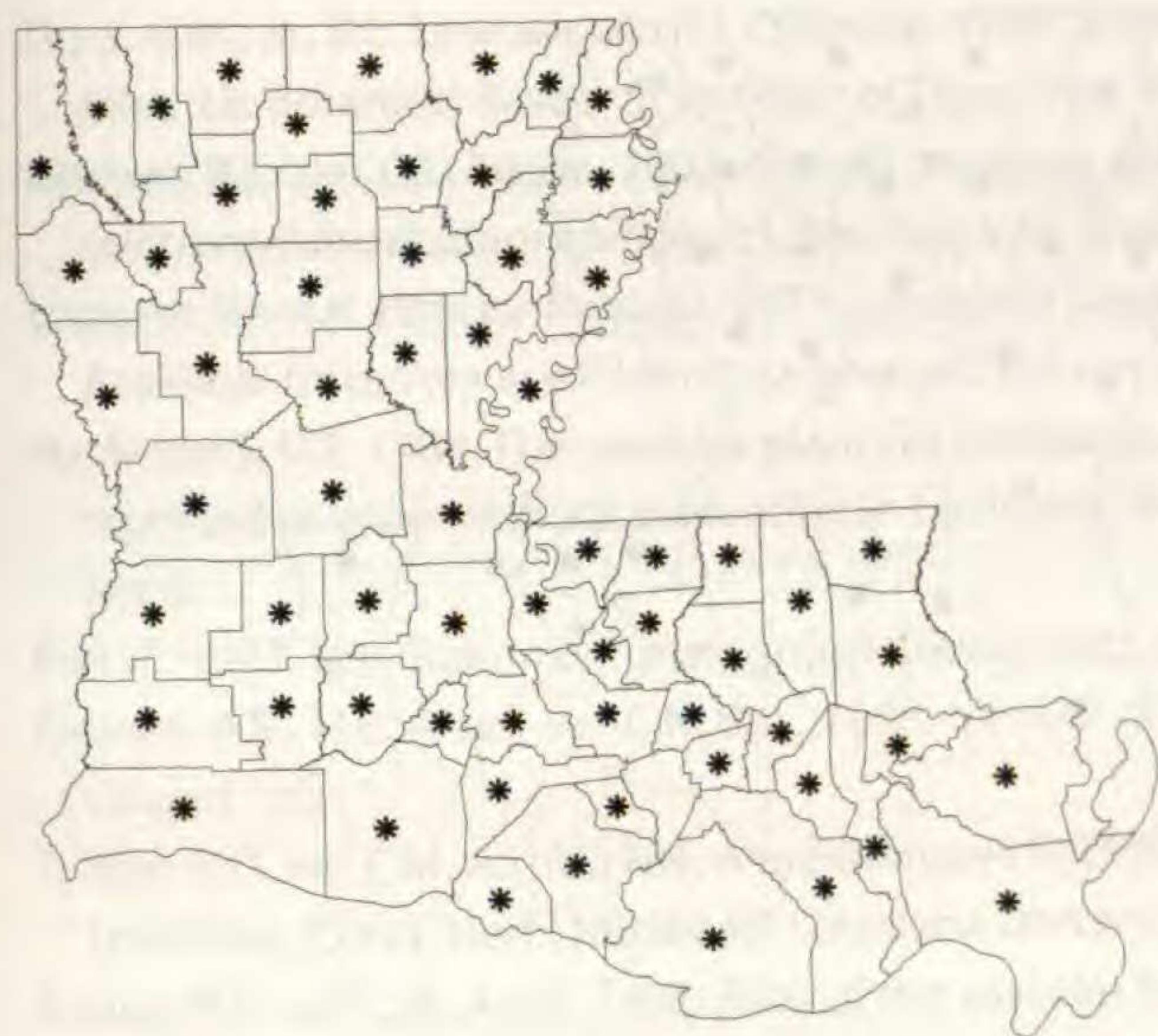


FIG. 1. Known distribution of *Galium aparine* in Louisiana.



FIG. 2. Known distribution of *Galium circaeans* in Louisiana.



FIG. 3. Known distribution of *Galium hispidulum* in Louisiana.

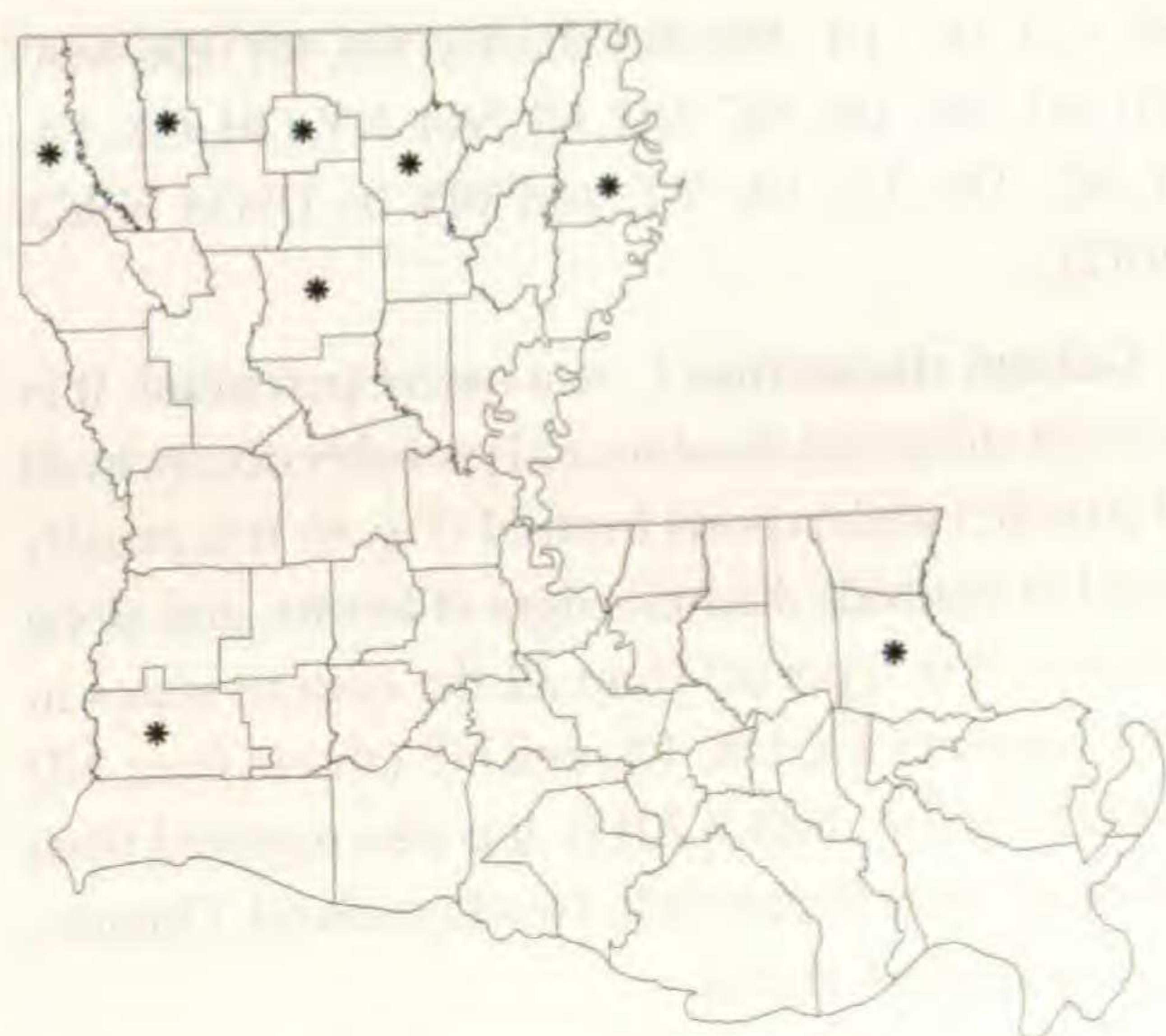


FIG. 4. Known distribution of *Galium parisiense* in Louisiana.



FIG. 5. Known distribution of *Galium pilosum* in Louisiana.

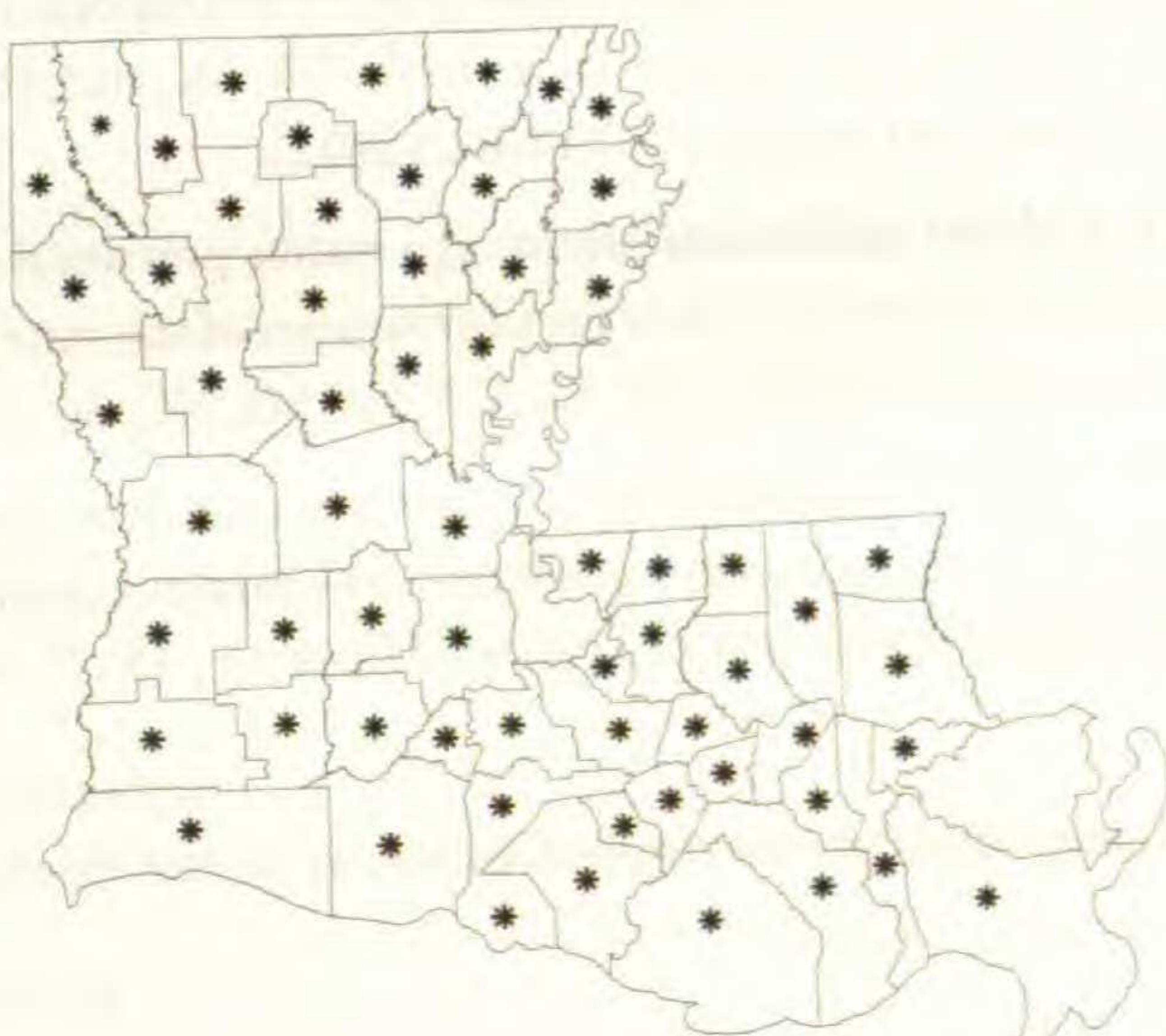


FIG. 6. Known distribution of *Galium tinctorium* in Louisiana.

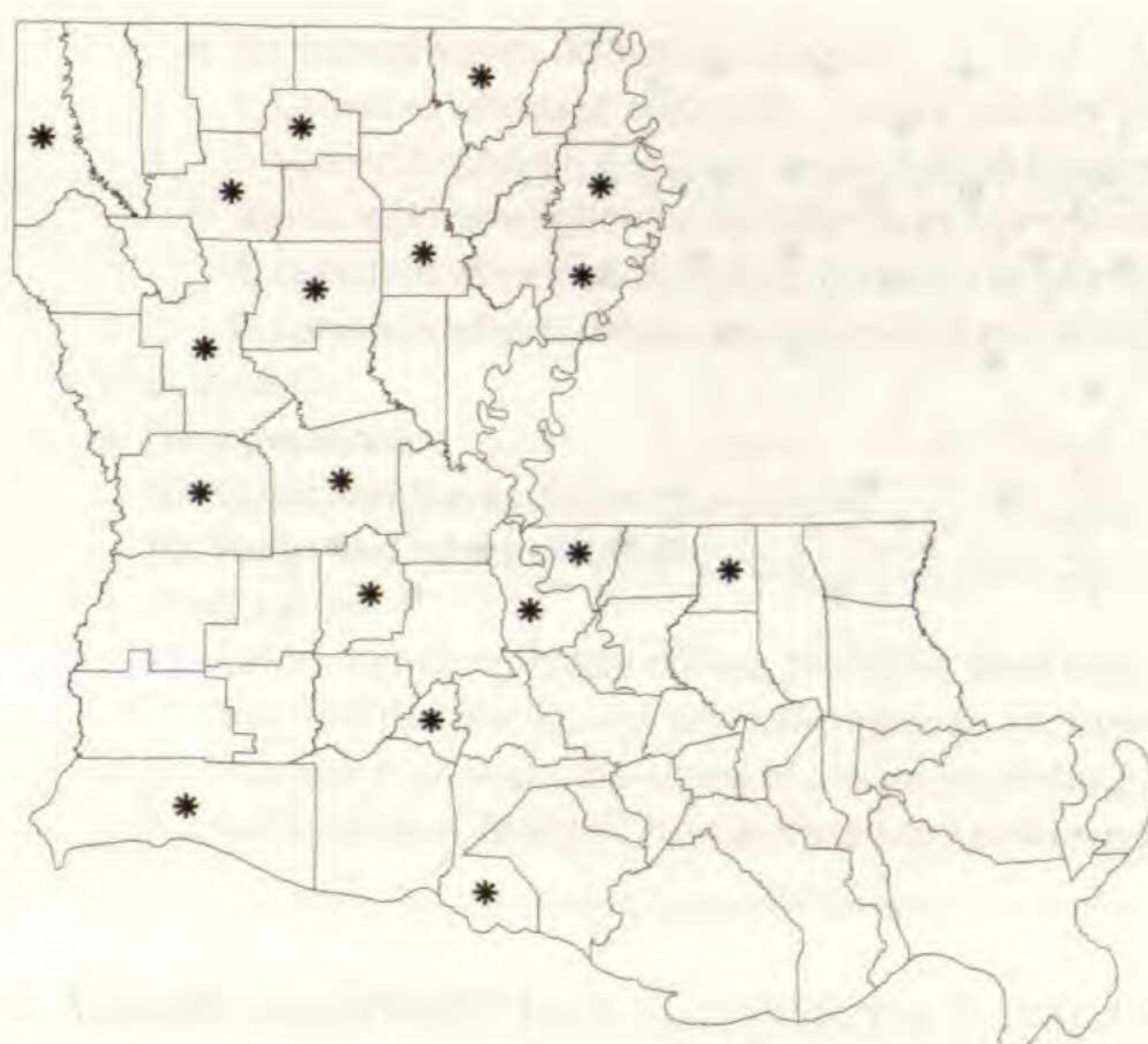


FIG. 7. Known distribution of *Galium triflorum* in Louisiana.

AR, CO, DC, DE, FL, GA, IL, IN, KS, KY, LA, MA, MD, MI, MO, MS, NC, NH, NJ, NM, NY, OH, OK, PA, RI, SC, TN, TX, VA, VT, and WV by USDA NRCS (2012).

9. *Galium tinctorium* L. is a native perennial. It is widespread across the state and probably occurs in all 64 parishes with reports from 62 (Fig. 6). It is usually found in roadside ditches, edges of forests, and along streams. It is reported from all the eastern states in the US west to TX, OK, KS, and NE (absent from ND and SD) (USDA, NRCS 2012). It is also reported from Labrador, New Brunswick, Newfoundland, Ontario, and Quebec in Canada.

10. *Galium triflorum* Michx. is a native perennial that is widely distributed across the state mostly in hardwood forests along streams (Fig. 7). It is reported from all 48 conterminous states in the US, AK, and all provinces in Canada (USDA NRCS 2012).

11. *Galium uniflorum* Michx. is a native perennial. It is a plant of hardwood forests along streams in fairly well drained areas within the pine regions of the state (Fig. 8). In the US, it is restricted to the coastal plain area with reports from AL, AR, FL, GA, LA, MS, NC, SC, TX, and VA (USDA NRCS 2012).

12. *Galium virginatum* Nutt. is a native annual. It is reported mostly from prairie areas in west central Louisiana (Fig. 9). This species is considered to be rare in Louisiana (S2) (Louisiana Natural Heritage Program 2012). In the United States, it is also reported from AL, AR, IL, KS, MO, MS, OK, SC, TN, and TX (USDA NRCS 2012).

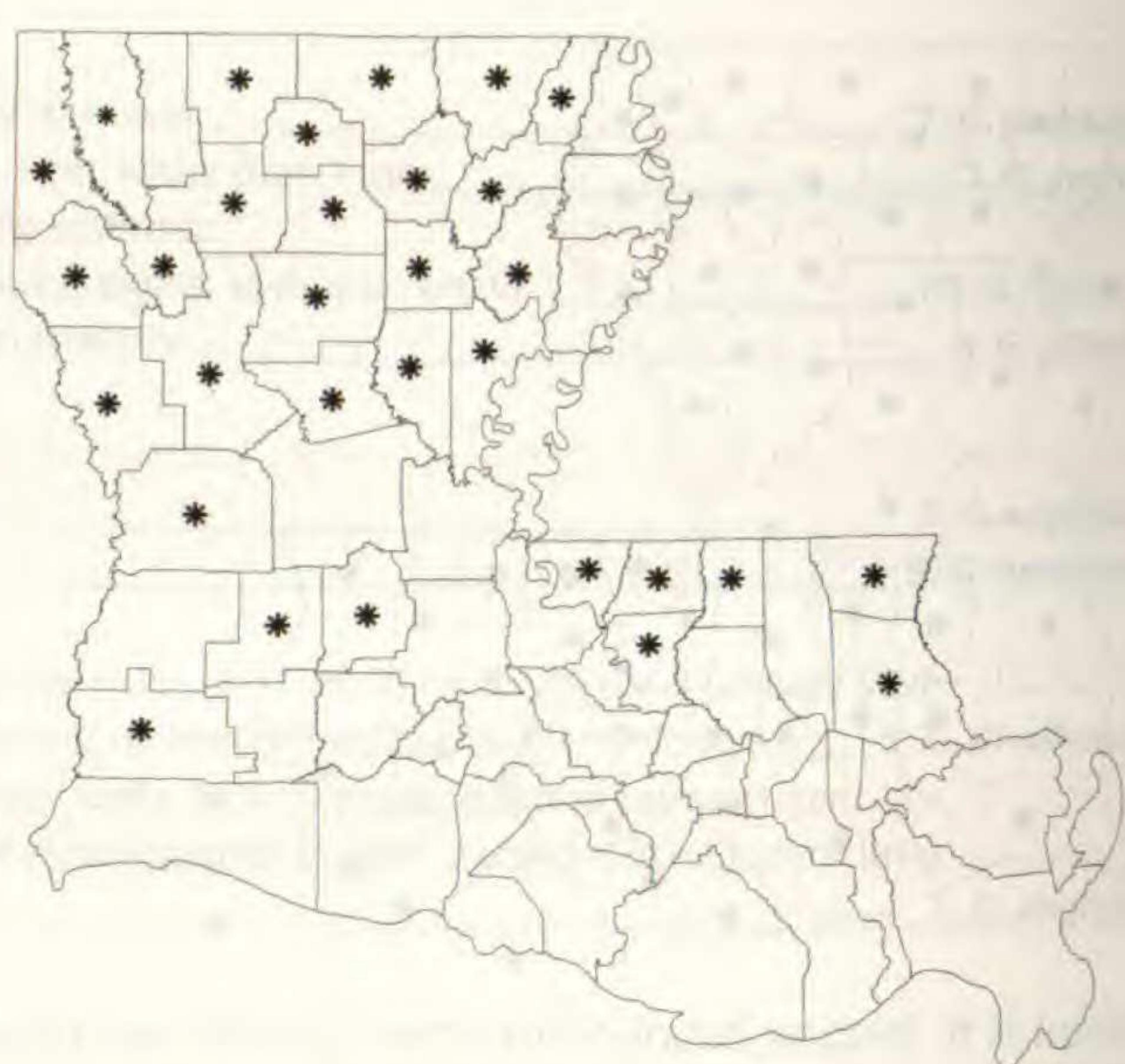


FIG. 8. Known distribution of *Galium uniflorum* in Louisiana.



FIG. 9. Known distribution of *Galium virginatum* in Louisiana.

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ACKNOWLEDGMENTS

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